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# Public Debt and Fiscal Policy in Developing Countries*

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## Abstract

This paper discusses the interrelationships between fiscal deficits and public debt. It analyzes the sources of growth of domestic and foreign public debt, and deals with the fiscal policy constraints imposed by a high level of indebtedness. It also discusses the macroeconomic effects of public debt, concentrating on the external sector and monetary policy implications as well as the effects on key prices throughout the economy.

The empirical section presents some stylized facts about the evolution of foreign debt in a selected group of developing countries and estimates its sources of growth as well as the factors affecting interest rates in debtor countries.

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## I. Introduction

Over the past decade the growth of public spending has generated large fiscal deficits in many countries, leading to increases in the share of public debt relative to gross domestic product (GDP). This happened in both industrial and developing countries. With the exception of a few, small countries such as Ireland and Denmark, the increase in public debt in industrial countries has been mostly domestic. In the developing countries, on the other hand, the public debt has been mostly external, although some countries, including Brazil and Mexico, have also accumulated sizable domestic debts.

Public debt imposes constraints on economic policies in all countries. However, these constraints tend to be different depending on the maturity of the debt and on whether it is domestic or foreign. The share of concessionary debt in the total debt of a country is also of importance since concessionary debt carries lower servicing costs. A certain part of the debt of developing countries has concessionary elements while the debt of the industrial countries has been acquired generally on commercial terms.

This paper is somewhat eclectic. It aims at providing a broad discussion of some debt-related issues of particular relevance to the developing countries and providing, in a consolidated manner, essential data to analyze the major issues. This information shows some surprising trends.

A paper covering developing countries must, by necessity, isolate a certain representative group as it would be difficult to deal with all of them. Several possible samples could have been chosen. However, we felt that in view of the importance attached to the Baker initiative in recent months, one obvious possibility was to concentrate on the 15 countries mentioned in Secretary Baker's speech at the World Bank/IMF Annual Meetings of the Boards of Governors in Seoul last October. We shall refer to them as the 15 Baker countries. This group includes the most highly indebted developing countries with good prospects for returning to spontaneous financial flows. 1/

Section II discusses the nature of the relationship between fiscal deficits and the accumulation of public debt. Section III deals with the constraints imposed by the presence of large public sector indebtedness on fiscal policies. Section IV considers other macroeconomic effects of public debt. Section V reports the results of an econometric analysis of the determinants of changes in foreign debt and in interest charges on foreign liabilities for the 15 Baker countries.

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1/ The 15 Baker countries are: Argentina, Bolivia, Brazil, Chile, Colombia, Cote d'Ivoire, Ecuador, Mexico, Morocco, Nigeria, Peru, Philippines, Uruguay, Venezuela, and Yugoslavia.

## II. Fiscal Deficit and Public Debt

Fiscal deficits are prerequisites for the accumulation of public debt, since usually the issue of government liabilities arises from the need to finance the gap between ordinary revenues and total expenditures. However, the existence of fiscal deficits does not necessarily imply that the share of debt in GDP will grow over time. If a fiscal deficit is financed totally by foreign grants or by monetary expansion, then public debt will not grow, and may actually fall, in relation to GDP. Other variables are also important in that relationship; for example, the rate of growth of the economy and the real rate of interest on the existing public debt play a significant role. The time horizon is also relevant. If fiscal deficits are cyclical, in the sense that they turn into surpluses during boom years, there would be no accumulation of debt and no expansion in the debt/GDP ratio over the cycle.

The first basic question to be asked in this context refers to the motivation of countries to allow the growth of public debt. Several answers could be given, some more important than others for developing countries. The main reasons or justifications that have traditionally been mentioned in the literature to explain or justify the growth of public debt are the following:

1. War finance. Wars require a sharp but transitory growth in public spending. Thus it makes sense to finance at least part of the increased spending through the sale of bonds rather than through taxation. Historically, in industrial countries this has been the main reason for the large accumulation of public debt as witnessed by the United Kingdom during the Napoleonic Wars and by the United States during the Civil War and World Wars I and II.

2. Development finance. The accumulation of public debt can arise from the need to finance a "big push" in economic development. A country that at a given stage of its economic development engages in large expenditure on infrastructure would perhaps be justified in financing this through debt, provided that the expected rate of return of the development projects exceeds the cost of borrowing. In other words, if borrowed funds are invested efficiently, they can be expected to promote enough future growth so that the debt can be serviced, without difficulties, out of future higher incomes. Such reasoning is used to justify borrowing on the part of successful private corporations. It has also been used to justify large deficits and large borrowing on the part of some developing countries.

3. Availability of cheap credit. Large borrowing by developing countries between 1974 and 1980 could be justified by the availability of cheap international credit. Given the low real rate of interest then prevailing in the international financial market, countries could borrow to finance the many projects with expected rates of return

higher than the prevailing low real costs of borrowed funds. There were many projects that passed a benefit-cost test given the low real rates of interest.

4. Government market power. Public sector borrowing by developing countries has at times been justified on the basis of the special position of the government as a borrower. It has been argued that the government can borrow abroad at lower rates than private borrowers since it carries a perceived lower risk and borrows larger amounts, thus reducing administrative costs. Private borrowers would pay higher rates if they borrowed directly. This arbitrage on the part of the government increases its gross debt while it may not increase immediately its net debt if the funds are, in turn, onlent to the rest of the economy. But, if the onlending is done at subsidized rates, the gross debt of the government can become, at least partially, a net debt. The fact that public as well as private enterprises obtain subsidized credit has, of course, made them less careful in project selection and has increased the role of political considerations in that selection.

5. Assumption of private sector debt. In a number of developing countries, particularly in Latin America, an important source for increases in the level of public debt has been the "nationalization" of private sector liabilities. In many countries governments have assumed the debt acquired by private sector enterprises, including financial institutions. In some cases, the private sector liabilities were originally guaranteed by the government, but in many other instances the government assumed the debt to avoid massive defaults that could have resulted in an extensive disruption for the domestic economy and a major loss of creditworthiness abroad.

6. Financing current expenditure. In many instances governments borrowed for consumption purposes, as they could score political gains in the short run by increasing subsidies or public employment without raising domestic revenues. The government obtained immediate political benefits by spending the proceeds of borrowing while the repayment of the debt was in the future and thus a successor government's problem. This public choice reason has certainly played a large role in the growth of public debt.

Some of the above reasons explain the emergence of large public debts. They do not explain, however, why industrial countries normally borrowed domestically while developing countries often borrowed abroad. To deal with this issue, we must review the different sources of financing available to governments to cover their expenditures. This issue highlights basic differences between industrial and developing countries. In all countries the most important source to finance public spending is obviously current revenue, a large proportion of which is made up of tax revenues. One would expect that taxes would cover a large share of public spending. However, there are many constraints on the level of

taxation: political, structural, administrative, or purely social. These constraints tend to be much more inflexible in developing than in industrial countries. Therefore, the average tax ratio of developing countries tends to be much lower, generally less than half, than the average tax ratio of industrial countries.

Experience indicates that it is very difficult to raise the tax level of developing countries significantly, at least in the short or medium run. There has been no experience among developing countries where the tax ratio has been raised by 10 or even 20 percentage points of GDP in a matter of one or two decades, or by several percentage points in a few years as has happened in industrial countries. In those developing countries where increases in the ratio of taxes to GDP have taken place, these increases have been relatively small. Moreover, in some of these countries, and particularly in those with high and increasing public debt, that ratio has fallen over time.

As in industrial countries, developing countries can try to tap domestic savings through the sale of bonds in the domestic market. This possibility, however, is very limited and only few developing countries have managed to finance a large proportion of their expenditure through increases in domestic debt. 1/ In no case have developing countries been as successful on this score as industrial countries. The reasons for this outcome are (a) the small size of the domestic capital market and the limited role of financial intermediaries; (b) the high default and political risk perceived by potential bond buyers; 2/ (c) the interest rates policies often pursued by these countries which have constrained the free market determination of the rates, sometimes resulting in negative real rates of return and, therefore, in lack of attractiveness for domestic financial investments; (d) the desire to limit the crowding out of the private sector from an already small financial market; and (e) the maintenance of overvalued exchange rates which create incentives for holding foreign-currency-denominated assets. In several cases where deficits have been financed with domestic debt, this has been done through some form of forced lending, which inevitably includes an element of taxation. Similarly, in many cases part of the

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1/ In some of these cases, the government has "borrowed" the reserve requirements that commercial banks are required to keep with the central bank. Thus, the government has paid interest to the central bank and the latter has paid interest to the commercial banks (see Tanzi, 1985). The same applies to some type of "trustee" securities that insurance companies and pension funds are required to hold as a percentage of their total portfolio.

2/ This type of risk perception arises particularly when the growth of public financial debt exceeds that of government revenues since this may be seen as an indication that adjustments and reform programs may be implemented, including capital levies on bondholders or higher income taxes on interest incomes.

fiscal deficit has been financed through the building up of domestic arrears. Although these arrears normally amount to an increase in government liabilities, they are excluded from the statistics of public debt. In any case, domestic arrears, although important in a particular year, cannot be accumulated to more than a few percentage points of GDP over time.

All the above sources of financing public expenditure are not directly inflationary, although this conclusion would need to be qualified in several ways. For example, tax increases may affect costs and prices and, if indexation mechanisms are in place, they may also affect the rate of inflation over time if accommodated by the monetary authorities. Arrears will tend to affect the prices at which suppliers make goods available. Domestic bonds may influence the rate of inflation if they become highly liquid and thus lead to a reduction in the demand for money.

Besides the above (and presumably noninflationary) sources, public spending can be financed through monetary expansion, which will tend to have an inflationary impact. 1/ Inflationary finance can provide the government with financial resources allowing it to purchase a certain quantity of goods and services, and it would seem to free it from the constraints imposed on spending by the inability to raise taxes or to sell bonds. However, there is a limit to the total amount of resources (expressed as a share of GDP) that the government can acquire through the inflation tax. If the government pushes the rate of inflation beyond it, it will actually end up with less real resources. This is well known (see Cagan, 1956). Less well known, however, is that the maximum amount of resources that can be acquired through inflationary finance is no indication of the net additional public spending that can be financed through this source (see Tanzi, 1978). The reason is that higher reliance on inflationary finance will normally reduce other revenue sources. This is very important for taxes but is also important for bond financing. Regarding taxes and recognizing that (a) there are always collection lags, (b) that some taxes are levied with specific rates, and (c) that progressive income taxes represent only a small share of total tax revenue in developing countries (so that there is no significant fiscal drag), there is often a loss in real tax revenues associated with the acceleration of inflation 2/ (see Tanzi, 1977). In

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1/ This impact is reduced by the real rate of growth of the economy (see Friedman, 1971).

2/ This implies that countries that bring about a program of price stabilization, such as the Plan Austral in Argentina and the stabilization plan in Israel (both initiated in 1985), and the 1986 Cruzado Plan in Brazil, will experience an automatic increase in the share of tax revenue in GDP. Furthermore, their fiscal deficit as conventionally measured will decline even more because the reduction in the rate of inflation will reduce nominal interest rates and thus interest payments.

addition, acceleration in the rate of inflation tends to increase the risk of holding financial assets (particularly if they are not fully indexed) and to lower the real demand for bonds. 1/

The above discussion has highlighted the motivations for debt financing and the particular importance that foreign sources acquire in developing countries, an importance that they do not often have in industrial countries given the availability of other sources. What have been the immediate consequences of external financing? Foreign financing can come in a variety of ways, including: (a) grants; (b) concessionary loans; (c) project loans; (d) suppliers' credit; and (e) commercial borrowing (see Tanzi, 1985, for more details). Grants and concessionary loans are very attractive but not costless. In both of these cases the costs are often political. Project loans and suppliers' credit may have concessionary elements but may also have hidden costs that make them less desirable than one would assume from the explicit cost. For example, they may force the countries to make purchases in markets where supplies are not cheaper or of desirable quality and they may tempt the countries to change the structure of their investment budgets because of the availability of financing for specific and often less profitable projects.

The most important source of foreign financing of public spending in recent years has been commercial borrowing. This borrowing has been done with varying maturities and with variable or fixed rates. Commercial borrowing played a major role in allowing developing countries to maintain levels of public spending higher than would have been possible through domestic sources. Thus, it probably contributed to the growth of the public sector in developing countries. The growth of commercial borrowing up to 1981 was phenomenal as will be shown in the empirical section (Section V) of this paper. Both supply and demand factors played a role in determining this growth.

In the 1970s the growth of debt financing from commercial banks was constrained mainly by demand considerations. OPEC surpluses made commercial banks very liquid, forcing them to compete among themselves to extend credit to the developing countries. In this period, it was not unusual for a finance minister of a developing country to be approached by the representatives of several foreign commercial banks and to be offered loans at terms that looked very attractive. This was a tremendous temptation as it made the financing of higher public spending seem almost costless. Mexico, Brazil, Venezuela, and many other countries could get practically all the foreign credit that they

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1/ It will also tend to increase the demand for dollar bills. This phenomenon, generally referred to as dollarization of the economy, has acquired great importance in Argentina, Brazil, Mexico, and other developing countries. Dollarization reduces even more the net gains, in terms of revenue, from inflationary finance (see Tanzi and Blejer, 1982).

wanted at very low real rates of interest. Public spending and foreign debt grew mainly in line with the demand for that credit by these countries. Foreign borrowing served the double purpose of financing the budgetary gap and the current account deficit in the balance of payments. There was, thus, a substantial net capital transfer from the industrial to the developing countries.

In the 1980s the situation changed dramatically. OPEC surpluses started to disappear, real interest rates rose, and the servicing costs on the public debt that had accumulated in the earlier period became extremely high, particularly for those countries with high ratios of debt to GDP. 1/ In addition, prices of commodities, which represent a major share of developing countries' exports, declined strongly relative to industrial countries' export prices. Doubts about the ability of developing countries to service their debt started to emerge and the perceived risk associated with further exposure for private banks started to increase. The growth of foreign borrowing eventually came to be constrained by the supply of credit. Commercial banks became reluctant to keep increasing their lending to developing countries or even to agree to the automatic rolling over of the maturing debt. This, combined with the sharply higher real rate of interest, which also reflected increasing risk, reversed the direction of net capital flows. During this period developing countries have been faced with the need to generate substantial trade account surpluses to service their foreign obligations.

## III. Public Debt and Fiscal Policy Constraints

Let us now turn our attention to the constraints that the presence of large public debt imposes on fiscal policy. We shall concentrate on fiscal policy but there are obvious constraints on other policies as well. In a detailed discussion of this issue, it would be desirable to discuss the policy constraints arising from four distinct situations: (a) all public debt is held domestically; (b) all public debt is held outside the country; (c) capital flight is an important concern; and (d) the citizens of the country already hold large assets in foreign countries which they could be encouraged to repatriate. Space limitations allow only a general discussion of these alternatives.

The first obvious fiscal policy constraint associated with the existence of a large public debt is a direct consequence of the need to service that debt. The government has to make payments that include

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1/ Debt service payments as a percentage of exports of goods and services increased from 12.7 percent in 1973-74 to 23 percent in 1983-85. For the 15 Baker countries, this ratio increased from 18.2 percent in 1973-74 to 42.6 percent in 1983-85. See International Monetary Fund, World Economic Outlook (1986).

interest and amortization. For an unchanged level of government revenue and non-interest expenditure, the rise in interest payments associated with a rise in the public debt will increase the size of the fiscal deficit. This immediately raises an issue that has attracted some attention in recent writings: the need to make a distinction between nominal and real interest payments or, looking at it from a different angle, the need to distinguish a conventionally measured deficit from an inflation-adjusted deficit. The higher the expected rate of inflation (and, therefore, the higher the nominal interest rate), and the higher the ratio of debt to GDP, the greater the spread between the conventional measure of the deficit and the inflation-adjusted measure will tend to be. 1/

This is not the place to discuss the pros and cons of these two approaches to the measurement of the fiscal deficit. Writers have sharply separated themselves into those who would make no adjustment to the conventionally measured deficit and those who believe that only an inflation-adjusted deficit provides a meaningful measure of the fiscal correction that a country needs. 2/ In any case, the increase in nominal interest payments will tend to increase the financial resources needed to cover the fiscal gap, and when further borrowing is no longer a viable possibility it will force the country to either reduce non-interest public spending or to increase taxes. This is a major constraint that a large debt imposes on fiscal policy, a constraint that may have important implications for the potential growth of the economy. 3/

One problem observed in many countries that have been forced to reduce public expenditure is that the reduction in non-interest spending often does not follow efficiency considerations but rather political expediency. Thus, countries that have had to adjust their non-interest public spending have (a) reduced wages rather than public employment; (b) reduced capital rather than current expenditure; (c) reduced domestically financed investment while maintaining investment projects financed by foreign sources, even though these may have lower productivity; and (d) reduced maintenance costs rather than entitlements. The net result has been a structure of public spending less conducive to growth.

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1/ Since for developing countries the domestic rate of inflation is often much greater than the rest-of-the-world rate, this problem is particularly related to domestic debt. For a country with mostly foreign debt, the two measures of deficit tend to be much closer together.

2/ Generally, academicians have favored the inflation-adjusted deficit while most practitioners have favored the conventional measure.

3/ Additional distorting effects which bear on potential growth may arise when a growing debt is perceived as a harbinger of future tax increases.

Countries have also attempted to accommodate the increased spending associated with higher interest payments by raising taxes but generally they have not been very successful. In any case, concern about capital flight has reduced the possibilities to increase taxes on income and wealth. Thus, countries have increased import duties, export taxes, indirect taxes, and especially excises and fuel taxes. Although the increase in indirect taxes is not necessarily damaging to the economy, the increase in foreign trade taxes often increases distortions and thus reduces the growth potential of the country.

The existence of large debt has also put pressures on governments to reduce the subsidies that central governments often pay to public enterprises. Here again the result has often been an increase in tariffs rather than a cut in employment or a greater concern with efficiency. As the problems of public enterprises are often due to excessive employment and to poor management, the increase in tariffs validates existing inefficiencies.

While it is considered that only interest payments contribute to the fiscal deficit, all the servicing of foreign debt, including both interest and amortization, contribute to the total government outlay or to what is sometimes referred to as the public sector borrowing requirement. If amortization payments could be fully refinanced through an equal borrowing obtained at similar conditions, those amortization payments would not create difficulties for fiscal policy. However, when the financial climate is changing, either because of changes in the risk associated with lending to that particular country or because the international financial climate itself has changed, the cost of borrowing may go up so that borrowing to pay for amortization or restructuring of the existing debt often increases interest costs. This is particularly true when the country is unable to pay even the interest due and, thus, it goes into arrears vis-à-vis interest payments. In this case the arrears are an automatic way of financing the unpaid interest part of the deficit. In the short run, however, these arrears are likely to reduce the availability of foreign financing thus reducing the country's growth potential. In the longer run, arrears are likely to increase the cost of borrowing thus raising deficits and putting even more of a squeeze on non-interest public expenditure.

## IV. Macroeconomic Effects of Public Debt

The existence of a large stock of public debt has consequences not only for the management of fiscal policy but also for other areas of macroeconomic policy. These implications can be analyzed better if we consider separately the effects of public debt on the external sector and on the domestic economy through the impact on the effectiveness of monetary policy and on the determination of key prices in the economy.

1. External sector implications

When most of the public debt is composed of liabilities to foreign countries, we are confronted with the double problem of assessing the impact of the outstanding debt not only on the fiscal budget but also on the balance of payments. A large volume of foreign debt usually requires an eventual trade surplus to generate the foreign exchange necessary to service the debt. This is particularly true when there are difficulties in rolling over the stock; in this case, in addition to interest payments, foreign resources must be generated to repay the principal.

Trade surpluses can be achieved through a number of means, such as (a) restrictions on imports, by imposing high import duties and/or quotas; (b) the implementation of an exchange rate policy conducive to such surpluses; (c) a reduction in the level of economic activity, which will compress the absolute level of imports; and (d) the encouragement of exports through export subsidies and export credits.

These alternatives are not costless for the economy. Although increasing exports may certainly be the preferred adjustment alternative, it may not be feasible in the short term and may involve considerable fiscal costs if it is achieved through subsidies. 1/ If the adjustment takes the form of import reductions, the long-term consequences may be serious. Especially when a large proportion of imports constitute intermediate goods, capital goods, or other raw materials important to the productive process, restrictions on imports inevitably result in a slowdown of investments and in a lower growth of the economy, thus leading to recession and unemployment. The adjustment that took place following the debt crisis of the early 1980s was predominantly of this sort. The external performance of the combined 15 Baker countries since 1978 is shown in Table 1.

In these countries taken together, the balance of trade swung from a deficit of $7 billion in 1981 to a surplus of more than $40 billion in 1984. This resulted, however, from a 42 percent contraction in imports from 1981 to 1984 coupled with a 5 percent reduction in exports. The huge surplus of about $70 billion in the three most recent years was, therefore, mainly generated by sharply lower imports without a

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1/ Export subsidies often violate international trade agreements and generate resentment and retaliation. A high rate of growth in industrial countries, of course, helps the growth of exports by developing countries. For this reason the solution to the debt crisis will be facilitated by a good economic performance by the industrial countries. Estimates made by the IMF staff suggest that a 1 percent change in industrial countries' real GNP is associated, on average, with about a 3 1/2 percent change in the same direction for export earnings of developing countries.

Table 1. External Performance of the 15 Baker Countries, 1978-84

| Year | Balance of Trade | Exports | Imports | Interest Payments/ Exports |
|---|---|---|---|---|
| | (In millions of U.S. dollars) | | | (In percent) |
| 1978 | -9,075.82 | 71,028.21 | 80,104.03 | 9.75 |
| 1979 | -1,855.32 | 95,671.14 | 97,526.46 | 10.86 |
| 1980 | 4,194.34 | 124,103.62 | 119,909.28 | 12.20 |
| 1981 | -6,550.43 | 124,509.28 | 131,059.71 | 14.34 |
| 1982 | 2,821.09 | 111,907.02 | 109,085.93 | 17.62 |
| 1983 | 27,578.58 | 108,053.92 | 80,475.34 | 17.32 |
| 1984 | 40,762.72 | 117,328.45 | 76,642.60 | 20.82 |

Sources: International Monetary Fund, International Financial Statistics, various issues; and DRI, External Debt File.

substantial improvement in export performance. 1/ Moreover, the proportion of exports absorbed by interest payments more than doubled during the period. Thus, it is not surprising that the rates of growth in many of these high-debt countries have been relatively slow or even negative in recent years.

In addition to direct price intervention in import and export markets, maintaining substantial trade surpluses requires an exchange rate policy consistent with that objective, i.e., a real devaluation of the currency and continuous adjustments, particularly in the presence of inflation, so the real exchange rate does not deteriorate. But such policy also implies a higher domestic currency value of interest payments on the foreign debt and an additional budgetary burden. In other words, a real devaluation followed by a policy of maintaining purchasing power parity results in an automatic increase of the foreign debt stock in domestic currency, with the consequent increase in the ratio of budgetary outlays to receipts.

Another aspect of this problem arises from the government's need to serve as guarantor of the private sector in foreign capital markets. Following the large exchange rate depreciation needed to generate trade surpluses, the private sector will often no longer be able to service its obligations abroad, 2/ so that the public sector will have to step in. Servicing the guaranteed debt imposes additional budgetary pressures, which in many cases result in monetization and further inflationary effects.

2. Monetary policy implications

In cases where at least part of the debt is held domestically, the presence of a large public debt imposes a number of constraints on the ability to conduct monetary policy. The ability of the public sector to finance its deficit by borrowing from the domestic private sector is facilitated by its privileged position in the capital market. But the amount of debt that the private sector is willing to hold is constrained by the value of its wealth, alternative investment opportunities, its preference for present or future consumption, and its anticipation of future economic policy. In these circumstances, the ratio between domestic public debt and GNP is stable at best. Thus, in real terms, it may be feasible to expand debt financing only at a rate roughly close to the rate of growth of the economy. But, as argued earlier, the rate of growth is likely to have been reduced due to the fall of imports.

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1/ Imports fell by $54.5 billion between 1981 and 1984. For a discussion of these trends in the Latin American context, see ECLA (1985).

2/ Even if it were able, the private sector might not gain access to the foreign exchange required.

The government can induce an increase in the debt/GNP ratio only by offering more attractive terms such as higher interest rates, greater liquidity, and shorter maturities. 1/

It should be mentioned, however, that the constraint on monetary policy imposed by the need to maintain high real interest rates arises even when most of the public debt is not domestically held. This is so because in the presence of a large foreign debt, expectations of exchange rate devaluations will tend to create large capital outflows unless attractive rates on domestic savings are offered. 2/

High stocks of debt, domestic or foreign, are therefore generally coexistent with high interest rates. This situation creates political difficulties since high real interest rates must be maintained at a time when real wages must be reduced to facilitate the adjustment and the servicing of the debt. This clearly has social implications, as workers will perceive this policy as inequitable, and will make it difficult for the government to pursue it.

3. The effect on key prices

The presence of a large public debt and the adjustments needed to service it result, as discussed above, in a clear impact on a number of key prices in the economy, including real interest rates, real wages, public utility rates, and exchange rates. What is characteristic of this impact is that the prices that emerge during the adjustment process are likely to be very different from their long-term equilibrium values. For example, if the surplus in the trade account needed to service the external debt is generated through a very depreciated exchange rate, this rate is likely to become lower in real terms than the long-term equilibrium real exchange rate that will emerge as the debt problem is resolved, and much lower than the rate that prevailed when the country was importing capital.

This has important implications for the determination of the optimal capital expenditures of the public sector and, in more general terms, for the investment budget of a country. For example, some investments that would be profitable at the long-run equilibrium rate

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1/ This effect arises not only from portfolio pressures and the competition for loanable funds but also from the effects of expectation regarding future monetization created by continuous debt-financed deficits which generally add a real risk premium to interest rates. Furthermore, if the individuals are rational they will expect the government to raise taxes in the future as the ratio of debt to GDP rises. Thus, they may not invest in assets that are more exposed to possible taxation.

2/ Or unless the domestic debt is denominated in foreign currency, which makes it quite similar to foreign debt.

would no longer be profitable at the present rates. This effect has, in fact, created difficulties for the investment budgets of many developing countries. While in the late 1970s investment budgets were swelled given the very low real rate of interest and the overvalued exchange rates which reduced the real cost of imported capital equipment, in the 1980s they have been sharply reduced due to the very high real interest rates and the undervalued exchange rates resulting from the high public debt levels. Investments that easily passed the test of profitability in the earlier period became highly unprofitable in the 1980s. 1/ This raises questions about the standards or criteria to be used to determine whether a large number of investment programs are worth being carried out or not and, for those already initiated, to determine whether they should be continued as originally planned.

## V. Empirical Issues on Foreign Public Debt of Developing Countries

The purpose of this section is to consider a number of stylized facts regarding the evolution of the external public debt, to analyze the burden that such debt is imposing on their economies, and to present some empirical results that confirm the discussion of the previous sections regarding the relative importance of fiscal deficits on the determination of different measures related to the burden of foreign debt.

With the purpose of gaining a longer term perspective on the subject, we analyze some trends and developments on external indebtedness for the 15 Baker countries during the period 1970-84, a period that includes important changes in the world economic environment in general as well as in the internal economic performance of the debtor countries.

### 1. Stylized facts about the evolution of foreign debt

Table 2 shows the evolution of total debt outstanding and disbursed for the 15 Baker countries, distinguishing between private and official creditors. 2/ The table also shows the evolution of yearly gross disbursements, both from private and official sources.

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1/ It should also be mentioned that the ordering of projects may also be drastically altered according to the different capital, labor, and imported inputs intensities of the different projects.

2/ The table presents data on long-term, public, and publicly guaranteed external debt with an original maturity of over one year. Publicly guaranteed debt is an external obligation guaranteed for repayment by a public entity. The data reported represent only the debt outstanding disbursed, i.e., total outstanding debt drawn by borrowers at year-end. Disbursements are the drawings on outstanding loan commitments during the year. Debt from official creditors comprises loans from international organizations and from governments and their agencies. Private creditors are suppliers, financial markets, and other unclassified private creditors.

Table 2. Public Debt Statistics: 15 Developing Countries, 1970-84

(In millions of U.S. dollars)

| Year | Debt Outstanding and Disbursed | | | Yearly Disbursements | | |
|---|---|---|---|---|---|---|
| | Total | Private creditors | Official creditors | Total | Private creditors | Official creditors |
| 1970 | 17420.00 | 7947.50 | 9472.50 | 3910.70 | 2308.50 | 1602.20 |
| 1971 | 20018.90 | 9460.80 | 10558.10 | 4175.00 | 2594.50 | 1580.50 |
| 1972 | 24444.00 | 12317.70 | 12126.30 | 6498.20 | 4423.90 | 2074.30 |
| 1973 | 30375.10 | 16683.00 | 13692.10 | 8193.00 | 5811.00 | 2382.00 |
| 1974 | 39900.90 | 23247.60 | 16653.30 | 11719.00 | 8285.80 | 3433.20 |
| 1975 | 48217.50 | 29072.70 | 19144.80 | 13229.90 | 9437.40 | 3792.50 |
| 1976 | 62190.50 | 40930.60 | 21259.90 | 18314.80 | 14970.20 | 3344.60 |
| 1977 | 79549.80 | 54828.70 | 24721.10 | 22233.00 | 17776.80 | 4456.20 |
| 1978 | 104603.30 | 75348.20 | 29255.10 | 33473.60 | 28906.50 | 4567.10 |
| 1979 | 124639.30 | 93102.90 | 31536.40 | 37996.60 | 32981.10 | 5015.50 |
| 1980 | 143226.10 | 107651.70 | 35574.40 | 34777.60 | 28032.20 | 6745.40 |
| 1981 | 164667.40 | 124769.00 | 39908.40 | 40984.20 | 32871.50 | 8112.70 |
| 1982 | 193270.00 | 148778.30 | 44491.70 | 41759.80 | 33015.80 | 8744.00 |
| 1983 | 240759.30 | 190296.80 | 50462.50 | 33763.00 | 24750.80 | 9012.20 |
| 1984 | 269134.10 | 210918.30 | 58215.80 | 26583.30 | 17086.80 | 9496.50 |

Sources: World Bank, World Debt Tables (1986); and DRI, External Debt File. The countries included are: Argentina, Bolivia, Brazil, Chile, Colombia, Cote d'Ivoire, Ecuador, Mexico, Morocco, Nigeria, Peru, Philippines, Uruguay, Venezuela, and Yugoslavia.

The evolution of foreign indebtedness of the sample countries shows a huge rise, from $17.5 billion to $269.1 billion, in the 15-year period. While, in 1970, 55 percent of the total debt was owed to official institutions, the percentage had fallen to less than 22 percent by 1984. As indicated in Table 3, the average rate of growth of total debt exceeded 20 percent yearly during the 1970s, and fell below 17 percent between 1980 and 1984. When deflated by changes in the terms of trade of the countries involved, the rate of growth of debt outstanding fell from an average of 27 percent a year between 1971 and 1975 to about 12 percent between 1980 and 1984. 1/ Such a reduction in the rate of growth of total indebtedness was caused mainly by a large contraction in disbursements of new debt after 1982. As also shown in Table 3, the rate of growth of new disbursements fell from an average increase of 30 percent a year in the 1970s to an average contraction of about 7.5 percent a year in the 1980s. Notice, however, that such a reduction on new disbursements was largely accounted for by a contraction in new lending by private creditors (of about 10 percent a year), while official creditors continued to lend, albeit at a lower rate than before. As a whole, public external debt increased by more than 1400 percent in nominal terms and more than 1000 percent in real terms.

Another important feature is the continuous increase in the amount of interest payments made by these countries. Table 4 shows that interest payments rose from less than $1 billion in 1970 to more than $24 billion in 1984, which implies an effective increase in the rate of interest paid from 5 percent to more than 9.5 percent 2/ (see Table 5).

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1/ Although nominal debt has been frequently deflated using some measure of international inflation or, alternatively, changes in export unit prices of the debtor countries, deflating the changes in the nominal volume of foreign debt by changes in the terms of trade is, probably, the most appropriate measure of the changes in the real value of the outstanding liabilities of the country. This is so because external inflation that does not change relative prices between imports and exports does not change the burden of the debt in terms of purchasing power or of the ability of a country to pay. On the other hand, an improvement in the terms of trade reduces the real value of the debt even in the absence of international inflation.

2/ The effective interest rate is defined as total interest payments in year t, divided by the average amount of outstanding debt in years t and t-1. This increase in the effective interest rate paid should be, however, qualified since it may be partly biased by the nominal appreciation of the dollar over the period. This is so because the stock of debt denominated in other currencies is converted into dollars at the exchange rate prevailing at the contracting dates while interest payments are converted at the rate at the time of payment. In this case, the stock outstanding is understated and the interest ratio overstated.

Table 3. Debt Outstanding and Yearly Disbursements: 15 Developing Countries, Nominal and Real Rates of Growth, 1971-84

(In percentage change and indices, 1970=100) 1/

| Year | Debt Outstanding | | | | Yearly Disbursements--Nominal Growth | | |
|---|---|---|---|---|---|---|---|
| | Nominal Growth | | Growth deflated by terms of trade | | | | |
| | Index | In percent | Index | In percent | Total | Official creditors | Private creditors |
| 1971 | 114.92 | 14.92 | 117.58 | 17.58 | 6.76 | -1.35 | 12.39 |
| 1972 | 140.32 | 22.10 | 141.77 | 20.57 | 55.65 | 31.24 | 70.51 |
| 1973 | 174.36 | 24.26 | 152.64 | 7.67 | 26.08 | 14.83 | 31.35 |
| 1974 | 229.04 | 31.36 | 199.09 | 30.43 | 43.04 | 44.13 | 42.59 |
| 1975 | 276.76 | 20.84 | 314.56 | 58.00 | 12.89 | 10.47 | 13.90 |
| 1976 | 356.97 | 28.98 | 378.79 | 20.42 | 38.43 | -11.81 | 58.63 |
| 1977 | 456.61 | 27.91 | 418.64 | 10.52 | 21.39 | 33.24 | 18.75 |
| 1978 | 600.39 | 31.49 | 621.35 | 48.42 | 50.56 | 2.49 | 62.61 |
| 1979 | 715.37 | 19.15 | 679.13 | 9.30 | 13.51 | 9.82 | 14.10 |
| 1980 | 822.03 | 14.91 | 711.73 | 4.80 | -8.47 | 34.49 | -15.01 |
| 1981 | 945.17 | 14.98 | 897.85 | 26.15 | 17.85 | 20.27 | 17.26 |
| 1982 | 1109.25 | 17.36 | 1002.89 | 11.70 | 1.89 | 7.78 | 0.44 |
| 1983 | 1381.79 | 24.57 | 1127.45 | 12.42 | -19.15 | 3.07 | -25.03 |
| 1984 | 1544.71 | 11.79 | 1163.98 | 3.24 | -21.26 | 5.37 | -30.96 |

Sources: Same as Table 1; and IMF, International Financial Statistics, various issues.

1/ Terms of trade are defined as the index of own export unit values divided by the index of U.S. export unit values. Deflated data are weighted averages for 15 developing countries, with the weights given by the share of each country's debt in total debt.

Table 4. Public Debt Statistics--Interest Payments and Net Flows: 15 Developing Countries, 1970-84

(In millions of U.S. dollars)

| Year | Interest Payments | | | Net Capital Flows 1/ | | |
|---|---|---|---|---|---|---|
| | Total | Private creditors | Official creditors | Total | Private creditors | Official creditors |
| 1970 | 856.40 | 500.30 | 356.10 | 1179.30 | 549.70 | 629.60 |
| 1971 | 941.60 | 552.10 | 389.50 | 1271.60 | 730.40 | 541.20 |
| 1972 | 1058.70 | 605.80 | 452.90 | 3125.20 | 2207.90 | 917.30 |
| 1973 | 1530.00 | 938.30 | 591.70 | 3379.80 | 2512.20 | 867.60 |
| 1974 | 2151.40 | 1461.10 | 690.30 | 5687.10 | 3953.30 | 1733.80 |
| 1975 | 2949.30 | 2073.20 | 876.10 | 5807.20 | 4069.10 | 1738.10 |
| 1976 | 3495.60 | 2446.30 | 1049.30 | 9625.20 | 8697.50 | 927.70 |
| 1977 | 4389.80 | 3136.60 | 1253.20 | 11225.00 | 9678.00 | 1547.00 |
| 1978 | 6473.60 | 4907.70 | 1565.90 | 14416.70 | 13209.90 | 1206.80 |
| 1979 | 9807.00 | 7913.70 | 1893.30 | 11297.50 | 10757.10 | 540.40 |
| 1980 | 13994.30 | 11902.60 | 2091.70 | 5670.20 | 3526.10 | 2144.10 |
| 1981 | 16931.30 | 14649.60 | 2281.70 | 8301.50 | 5376.50 | 2925.00 |
| 1982 | 20472.00 | 17809.10 | 2662.90 | 5973.60 | 3372.80 | 2600.80 |
| 1983 | 19762.30 | 16957.40 | 2804.90 | 1282.80 | -885.40 | 2168.20 |
| 1984 | 24274.30 | 20943.00 | 3331.30 | -9658.50 | -12351.70 | 2693.20 |

Source: See Table 2.

1/ Net capital flows are defined as disbursements net of debt service, i.e., disbursements - (interest payments + repayments).

Table 5. Average Interest on New Commitments and Effective Interest Rate Paid, 1971-84 1/

| Year | Interest Rate on New Commitments | | | Effective Interest Rate Paid | | |
|---|---|---|---|---|---|---|
| | Average | Private creditors | Official creditors | Average | Private creditors | Official creditors |
| 1971 | 6.64 | 7.48 | 5.75 | 5.03 | 6.32 | 3.89 |
| 1972 | 6.59 | 7.41 | 5.63 | 4.74 | 5.53 | 3.98 |
| 1973 | 7.64 | 8.93 | 6.01 | 5.63 | 6.48 | 4.60 |
| 1974 | 8.70 | 10.15 | 6.24 | 6.15 | 7.35 | 4.53 |
| 1975 | 8.28 | 8.89 | 6.99 | 6.73 | 7.96 | 4.89 |
| 1976 | 7.80 | 7.96 | 7.32 | 6.36 | 6.98 | 5.19 |
| 1977 | 7.98 | 8.18 | 7.47 | 6.19 | 6.53 | 5.42 |
| 1978 | 9.19 | 9.91 | 6.74 | 7.01 | 7.47 | 5.75 |
| 1979 | 10.97 | 11.93 | 7.00 | 8.54 | 9.36 | 6.23 |
| 1980 | 11.86 | 13.17 | 7.84 | 10.44 | 11.82 | 6.23 |
| 1981 | 14.14 | 16.03 | 8.62 | 11.02 | 12.63 | 6.03 |
| 1982 | 12.88 | 13.95 | 9.78 | 11.42 | 12.97 | 6.29 |
| 1983 | 11.20 | 11.81 | 9.12 | 9.09 | 9.94 | 5.86 |
| 1984 | 10.76 | 12.04 | 9.04 | 9.52 | 10.43 | 6.13 |

1/ Effective interest rate is defined as interest payment in year (t) divided by the average of debt outstanding between year (t) and (t-1). All data are weighted averages for 15 developing countries, with weights given by share of each country's debt in total.

Table 6 summarizes the impact of the above developments by showing the burden of public debt and interest payments on the economies of the countries involved. Debt outstanding increased from 10 percent of GNP in 1970 to more than 36 percent at the end of 1984, an increase mainly accounted for by the sixfold rise in the ratio to GNP of credit from private sources. The increase in the burden of interest payments in relation to the total product of these countries is also illustrated in Table 6: interest payments increased from less than half a percent of GNP to 3.3 percent of GNP by 1984.

A more dramatic illustration of the developments related to foreign debt in the 15 Baker countries is given by the net capital flows columns of Table 4. Net capital flows (i.e., disbursements net of debt service) indicate the availability of foreign savings transferred through the capital account. The combination of higher interest payments and lower disbursements resulted in a negative net transfer of about $10 billion in 1984 (compared with a positive net capital flow of $14.4 billion in 1978). Probably, the fall in net capital flows and the outflow of resources from developing countries are the most drastic examples of the consequences of the debt crisis of 1982. It is, however, important to observe that the negative net capital flows result from a combination of large outflows of resources to service the foreign debt owed to private creditors, while official creditors continue to be net lenders at about the same rate as in the early 1980s. 1/

Additional indications of the magnitude of the burden imposed by foreign public debt are given in Table 7, where magnitudes of stocks and flows are compared. While new disbursements amounted to more than 30 percent of the debt outstanding in the late 1970s (almost 40 percent private creditors), disbursements were less than 10 percent compared with the stock of debt in 1984. Again, this reduction in disbursements relative to the outstanding stock is explained exclusively by the reduction in new lending by private creditors. Even more important is the potential use of the yearly gross inflows. As shown in this table, more than 90 percent of new credit was offset by outflows of interest payments in 1984. It is noticeable that this relationship between interest payments and disbursements stood at below 20 percent in 1978 and at 25 percent in 1979, even if the average interest rate was not substantially different. The last two columns of this table indicate that in 1984 there was a clear transfer (even excluding repayments) from official to private creditors, since interest payments to the latter exceeded their disbursements while interest payments to the former were about one third of their disbursements.

It is evident from the above discussion that debt service is imposing a serious burden on highly indebted countries. Some casual empiricism shows that the level of the debt and the rates of growth of

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1/ This observation, although applicable to the sample as a whole, does not necessarily hold for individual countries.

Table 6. Ratios of Debt Outstanding and Interest Payments to GNP: 15 Developing Countries, 1970-84 1/

(In percentage terms)

| Year | Debt Outstanding and Disbursed/GNP | | | Interest Payments/GNP | | |
|---|---|---|---|---|---|---|
| | Total | Private creditors | Official creditors | Total | Private creditors | Official creditors |
| 1970 | 10.07 | 4.59 | 5.47 | 0.49 | 0.29 | 0.21 |
| 1971 | 10.29 | 4.86 | 5.43 | 0.48 | 0.28 | 0.20 |
| 1972 | 11.11 | 5.60 | 5.51 | 0.48 | 0.28 | 0.21 |
| 1973 | 11.26 | 6.19 | 5.08 | 0.57 | 0.35 | 0.22 |
| 1974 | 11.13 | 6.49 | 4.65 | 0.60 | 0.41 | 0.19 |
| 1975 | 11.73 | 7.07 | 4.66 | 0.72 | 0.50 | 0.21 |
| 1976 | 13.28 | 8.74 | 4.54 | 0.75 | 0.52 | 0.22 |
| 1977 | 15.26 | 10.52 | 4.74 | 0.84 | 0.60 | 0.24 |
| 1978 | 17.34 | 12.49 | 4.85 | 1.07 | 0.81 | 0.26 |
| 1979 | 17.08 | 12.76 | 4.32 | 1.34 | 1.08 | 0.26 |
| 1980 | 16.69 | 12.55 | 4.15 | 1.63 | 1.39 | 0.24 |
| 1981 | 17.54 | 13.29 | 4.25 | 1.80 | 1.56 | 0.24 |
| 1982 | 22.86 | 17.60 | 5.26 | 2.42 | 2.11 | 0.32 |
| 1983 | 33.68 | 26.62 | 7.06 | 2.76 | 2.37 | 0.39 |
| 1984 | 36.84 | 28.87 | 7.97 | 3.32 | 2.87 | 0.46 |

1/ Weighted average of individual country ratios. The weights are given by proportion of each country in total GNP.

Table 7. Disbursements and Interest Payments Ratios: 15 Developing Countries, 1970-84

(In percentage terms)

| Year | Disbursements/Debt Outstanding | | | Interest Payments/Disbursements | | |
|---|---|---|---|---|---|---|
| | Total | Private creditors | Official creditors | Total | Private creditors | Official creditors |
| 1970 | 22.45 | 29.05 | 16.91 | 21.90 | 21.67 | 22.23 |
| 1971 | 20.86 | 27.42 | 14.97 | 22.55 | 21.28 | 24.64 |
| 1972 | 26.58 | 35.91 | 17.11 | 16.29 | 13.69 | 21.83 |
| 1973 | 26.97 | 34.83 | 17.40 | 18.67 | 16.15 | 24.84 |
| 1974 | 29.37 | 35.64 | 20.62 | 18.36 | 17.63 | 20.11 |
| 1975 | 27.44 | 32.46 | 19.81 | 22.29 | 21.97 | 23.10 |
| 1976 | 29.45 | 36.57 | 15.73 | 19.09 | 16.34 | 31.37 |
| 1977 | 27.95 | 32.42 | 18.03 | 19.74 | 17.64 | 28.12 |
| 1978 | 32.00 | 38.36 | 15.61 | 19.34 | 16.98 | 34.29 |
| 1979 | 30.49 | 35.42 | 15.90 | 25.81 | 23.99 | 37.75 |
| 1980 | 24.28 | 26.04 | 18.96 | 40.24 | 42.46 | 31.01 |
| 1981 | 24.89 | 26.35 | 20.33 | 41.31 | 44.57 | 28.13 |
| 1982 | 21.61 | 22.19 | 19.65 | 49.02 | 53.94 | 30.45 |
| 1983 | 14.02 | 13.01 | 17.86 | 58.53 | 68.51 | 31.12 |
| 1984 | 9.88 | 8.10 | 16.31 | 91.31 | 122.57 | 35.08 |

these economies are highly negatively correlated. 1/ In a regression between the rate of growth and the level of foreign debt as a proportion of GNP in the 15 Baker countries involved and over the period 1972-84, the results are: 2/

$$\hat{Y} = \underset{(4.05)}{5.64} - \underset{(9.77)}{0.254}\ (\text{Debt/GNP}) \qquad R^2 = 0.446 \quad SEE = 4.94$$

$$\hat{Y} = \underset{(1.56)}{2.51} - \underset{(5.39)}{0.178}\ (\text{Debt/GNP}) + \underset{(3.58)}{3.48}\ DM \qquad R^2 = 0.483 \quad SEE = 4.78$$

Given the importance of the debt factor, and in order to complete the picture presented in the previous sections of this paper, in what follows we elaborate on some of the empirical determinants of the overall evolution of foreign debt and of its relative weight in the national economy. For this purpose, a more formal empirical analysis is carried out in the next section.

## 2. The sources of growth of foreign debt--regression results

The purpose of this section is to investigate some of the main factors that determine the changes in the stock of debt, both at the absolute level and as a percentage of GNP, highlighting the importance of the fiscal deficit, relative to other variables affecting the accumulation of debt. Two types of relationships were estimated, pooling the data for the 15 Baker countries over the period 1972-84. The first specification explains the changes in the level of external debt outstanding and disbursed ($\Delta D_t$). In addition to the fiscal deficit as a percentage of GDP ($Def_t$), whose role has been discussed in the previous sections, three variables related to the external sector are included. The cost of foreign credit, represented by the interest rate faced by the country, may affect the stock of debt in two opposite directions. An increase in interest rates may reduce the demand for new loans, but since most of the outstanding stock is subject to adjustable interest rates it may result in an increase in

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1/ However, the large borrowing that took place in earlier years had contributed to higher rates of growth in some countries. This is particularly true in those countries where borrowing had gone toward productive channels, increasing the size and efficiency of the economy and facilitating the servicing of the debt.

2/ $\hat{Y}$ is the rate of growth of real income, and DM is a dummy variable (1:1972-80; 0:1981-84) that distinguishes between the experiences before and after the sharp adjustments induced by the debt crisis. The observations are a time-series, cross-section pool and include 14 country-specific dummies. The figures in parentheses are t-values.

the stock of debt since countries may be forced to borrow more to service previous commitments. In order to capture the two effects, we include in the equation the average interest rate on new commitments in the previous year ($i_{t-1}$). Since foreign debt could certainly be contracted to close payments gaps, the balance of trade surplus (BoT) is added to the equation together with variations in the international prices faced by the country. This last variable would indicate whether changes in the stock of debt indeed respond to cyclical variations in international markets. It is measured, alternatively, by changes in the terms of trade ($\hat{TT}$) or by changes in the export unit values ($\hat{EUV}$). The estimated equation is therefore:

$$\Delta D_t = a_1 + a_2\ Def_t + a_3\ i_{t-1} + a_4\ BoT_t + a_5\ \hat{TT}_t$$

This equation was estimated for changes in the total stock of debt and separately for changes in debt originating from official and private sources. The general pattern of results, reported in Table 8, clearly confirm the importance of fiscal deficits in the determination of foreign debt. The coefficients of Def are highly significant in all the estimated equations, as are those of the interest rate faced by the country which turn out to have positive signs. Changes in the external prices of imports and exports, on the other hand, do not seem to have affected the changes in the absolute level of debt.

Regarding the balance of trade results, equations (1)-(2), (5)-(6), and (9)-(10) seem to indicate a positive relationship between the changes in the level of debt and the outcome of the balance of trade. This result, however, is not stable for the whole period under study. When a slope dummy variable with a value of 1 during the period 1972-80 and zero during 1981-84 is included multiplicatively with the balance of trade variable, the coefficient is significant and has an opposite sign with a magnitude similar to the balance of trade coefficient. This result suggests that during the 1970s external imbalances did not lead to changes in external debt, but in the 1980s increases in external debt were correlated with balance of trade surpluses, both of which moved positively during that later period. This last result, however, applies mainly to private sources.

Since the units of measurement differ somewhat for the different variables included in Table 8, in order to determine the relative influence of the various explanatory variables we calculate the Beta coefficients that measure the change in the dependent variable, other things being equal, for a unit change in each of the independent variables. The Beta coefficients are independent of units of measurement and can be compared directly within and across equations. The calculated Beta coefficients corresponding to the twelve equations in Table 8

Table 8. Changes in Debt Outstanding and Disbursed: 15 Developing Countries, 1972-84

$$\Delta D_t = a_1 + a_2\ Def_t + a_3\ i_{t-1} + a_4\ BoT_t + a_5\ \hat{TT}_t$$

| | Constant | $Def_t$ | $i_{t-1}$ | $BoT_t$ | $D(BoT)_t$ | $\hat{TT}$ | $E\hat{U}V$ | $R^2$/SEE |
|---|---|---|---|---|---|---|---|---|
| Total | | | | | | | | |
| 1. | -390.5 | 111.4 | 149.6 | 164.1 | | 4.934 | | 0.627 |
| | (0.69) | (3.75) | (3.58) | (3.65) | | (1.20) | | 1350.3 |
| 2. | -348.3 | 109.8 | 147.3 | 175.4 | | | 2.132 | 0.625 |
| | (0.60) | (3.62) | (3.45) | (3.97) | | | (0.65) | 1354.2 |
| 3. | -633.5 | 96.3 | 197.1 | 233.4 | -219.6 | 6.73 | | 0.641 |
| | (1.16) | (3.22) | (3.57) | (4.49) | (2.55) | (1.64) | | 1329.6 |
| 4. | -637.6 | 96.3 | 146.6 | 243.3 | -214.6 | | 3.72 | 0.638 |
| | (1.09) | (3.17) | (3.49) | (4.73) | (2.47) | | (1.13) | 1334.9 |
| Official sources | | | | | | | | |
| 5. | 76.96 | 23.42 | 25.76 | 16.33 | | -1.13 | | 0.473 |
| | (0.62) | (4.24) | (2.23) | (1.97) | | (0.15) | | 250.5 |
| 6. | 79.57 | 23.35 | 25.53 | 16.30 | | | -0.95 | 0.473 |
| | (0.62) | (4.17) | (2.17) | (2.00) | | | (0.16) | 250.5 |
| 7. | 74.03 | 23.20 | 25.65 | 17.30 | -2.99 | -0.88 | | 0.473 |
| | (0.59) | (4.11) | (2.21) | (1.76) | (0.11) | (0.11) | | 251.2 |
| 8. | 76.07 | 23.17 | 25.48 | 17.24 | -2.94 | | -0.73 | 0.413 |
| | (0.59) | (4.06) | (2.16) | (1.78) | (0.18) | | (0.12) | 251.2 |
| Private sources | | | | | | | | |
| 9. | -458.1 | 85.2 | 106.5 | 157.2 | | 4.561 | | 0.575 |
| | (0.79) | (2.85) | (2.88) | (3.53) | | (1.11) | | 1351.5 |
| 10. | -393.3 | 82.9 | 102.9 | 169.3 | | | 1.59 | 0.573 |
| | (0.67) | (2.72) | (2.75) | (3.88) | | | (0.49) | 1355.4 |
| 11. | -779.9 | 69.9 | 108.7 | 227.7 | -277.6 | 6.52 | | 0.592 |
| | (1.35) | (2.30) | (2.99) | (4.45) | (2.65) | (1.59) | | 1329.0 |
| 12. | -736.2 | 68.7 | 106.5 | 238.2 | -221.3 | | 0.33 | 0.588 |
| | (1.24) | (2.25) | (2.89) | (4.70) | (2.55) | | (1.02) | 1334.6 |

Notes: The regressions are a time-series, cross-section pool.

$\Delta D$ = Change in the outstanding stock of foreign public debt.
Def = Fiscal deficit as percentage of GDP.
i = Average interest rate on new commitments.
BoT = Balance of trade surplus
$E\hat{U}V_i$ = Rate of change of export unit values of country i.
$\hat{TT}$ = Rate of change of terms of trade defined as: $EUV_i - EUV_{US}$.
D( ) = Indicates a slope dummy variable (1:1972-80; 0:1981-84).

All equations include 14 country dummies; t-values are in parentheses; SEE is the standard error of the estimate.

are presented in Table 9. The main results are the following: for changes in total outstanding foreign debt, the fiscal deficit shows up as having the strongest effect relative to the other variables. Such an effect is particularly marked in the equations explaining borrowing from official sources (equations (5)-(8)). In these equations the interest rate and balance of trade variables have an effect only half as big as the fiscal deficit.

The second specification estimated relates changes in the ratio of debt outstanding to GNP. The estimated equation for this specification is the following:

$$\Delta(D/GNP)_t = b_1 + b_2\ Def_t + b_3\ i_{t-1} + b_4(BoT/GNP) + b_5\ \hat{TT}$$

The results for this specification are reported in Table 10. Again, the estimated coefficients for the fiscal deficit (as a percentage of GDP) and for interest rates turn out to be highly significant while the balance of trade variable shows a similar pattern as in the previous table, i.e., no significant effect over the 1970s and co-movements in the last four years. An important difference is the negative sign of the coefficient for changes in the export unit value. This seems to indicate that, ceteris paribus, a fall in the export prices faced by a country tends to increase the ratio of debt to GNP, probably through a combination of increased debt and a reduction in economic activity.

Regarding the Beta coefficients for equations (13)-(24) (Table 11), they indicate that as far as the ratio of total debt to GNP is concerned, fiscal deficits and interest rates have roughly equivalent effects, but the impact of interest rates seems to be a more important determinant in explaining the changes in the ratio of official credit to GNP.

To summarize, fiscal deficits and interest rates seem to be the most important variables determining changes in the stock of foreign debt. Concerning the changes in the absolute level, the effect of fiscal deficits emerges as the more important factor, particularly in determining borrowing from official sources. The balance of trade did not affect external exposure during the 1970s and is positively correlated with the changes in debt in the 1980s. The overwhelming importance of fiscal management in the evolution of foreign debt is therefore strongly confirmed by these sets of results.

### 3. The interest rate on public debt

Given the importance of the rate of interest faced by the borrowing countries in the determination of changes in total indebtedness, it seems important to try to determine some of the main factors affecting this rate. As is well known, the charges paid by the countries on

Table 9. Values of Beta Coefficients--Equations for the Change in the Debt Outstanding

| Equation Number | Def | i | BoT | D(BoT) | $\hat{TT}$ | $E\hat{U}V$ |
|---|---|---|---|---|---|---|
| Total debt | | | | | | |
| (1) | 0.246 | 0.189 | 0.220 | -- | 0.065 | -- |
| (2) | 0.242 | 0.185 | 0.236 | -- | -- | 0.035 |
| (3) | 0.213 | 0.186 | 0.314 | -0.192 | 0.088 | -- |
| (4) | 0.213 | 0.185 | 0.327 | -0.188 | -- | 0.061 |
| Official sources | | | | | | |
| (5) | 0.332 | 0.149 | 0.140 | -- | -0.009 | -- |
| (6) | 0.331 | 0.147 | 0.140 | -- | -- | -0.010 |
| (7) | 0.329 | 0.148 | 0.149 | -0.017 | -0.007 | -- |
| (8) | 0.328 | 0.147 | 0.148 | -0.017 | -- | -0.008 |
| Private sources | | | | | | |
| (9) | 0.201 | 0.151 | 0.225 | -- | 0.064 | -- |
| (10) | 0.195 | 0.146 | 0.243 | -- | -- | 0.028 |
| (11) | 0.163 | 0.154 | 0.326 | -0.213 | 0.091 | -- |
| (12) | 0.162 | 0.151 | 0.342 | -0.207 | -- | 0.058 |

Table 10. Changes in the Ratio of Debt Outstanding and Disbursed to GNP: 15 Developing Countries, 1972-84

$$\Delta(D/GNP)_t = b_1 + b_2\ Def_t + b_3\ i_{t-1} + b_4(BoT/GNP) + b_5\ \hat{TT}$$

| | Constant | $Def_t$ | $i_{t-1}$ | $\frac{BoT}{GNP}$ | $\frac{D(BoT)}{GNP}$ | $\hat{TT}$ | $\hat{EUV}$ | $R_2$/SEE |
|---|---|---|---|---|---|---|---|---|
| **Total** | | | | | | | | |
| 13. | -4.14 | 0.390 | 0.688 | 0.189 | | -0.027 | | 0.208 |
| | (1.74) | (3.03) | (3.96) | (1.70) | | (1.14) | | 5.815 |
| 14. | -2.97 | 0.353 | 0.627 | 0.233 | | | -0.356 | 0.223 |
| | (1.22) | (2.74) | (3.58) | (2.17) | | | (2.33) | 5.759 |
| 15. | -3.95 | 0.327 | 0.589 | 0.433 | -0.424 | 0.021 | | 0.248 |
| | (1.70) | (2.57) | (3.41) | (3.22) | (3.06) | (1.11) | | 5.681 |
| 16. | -3.00 | 0.301 | 0.546 | 0.455 | -0.399 | | -0.287 | 0.258 |
| | (1.26) | (2.36) | (3.14) | (3.48) | (2.87) | | (1.90) | 5.644 |
| **Official sources** | | | | | | | | |
| 17. | -3.89 | 0.167 | 0.541 | 0.048 | | -0.013 | | 0.282 |
| | (2.82) | (2.69) | (4.26) | (0.88) | | (1.49) | | 2.802 |
| 18. | -3.44 | 0.157 | 0.509 | 0.054 | | | -0.013 | 0.286 |
| | (2.38) | (2.50) | (3.88) | (1.01) | | | (1.78) | 2.794 |
| 19. | -3.77 | 0.158 | 0.513 | 0.084 | -0.060 | -0.013 | | 0.285 |
| | (2.70) | (2.53) | (3.93) | (1.23) | (0.87) | (1.39) | | 2.804 |
| 20. | -3.35 | 0.150 | 0.483 | 0.085 | -0.054 | | -0.012 | 0.286 |
| | (2.31) | (2.37) | (3.63) | (1.28) | (0.78) | | (1.64) | 2.798 |
| **Private sources** | | | | | | | | |
| 21. | -2.27 | 0.205 | 0.337 | 0.122 | | -0.014 | | 0.131 |
| | (1.21) | (2.06) | (2.83) | (1.44) | | (0.94) | | 4.47 |
| 22. | -1.50 | 0.180 | 0.306 | 0.158 | | | -0.022 | 0.144 |
| | (0.78) | (1.80) | (2.57) | (1.91) | | | (1.87) | 4.44 |
| 23. | -2.36 | 0.150 | (0.291) | 0.326 | -0.358 | -0.008 | | 0.186 |
| | (1.30) | (1.54) | (2.50) | (3.20) | (-3.42) | (0.57) | | 4.34 |
| 24. | -1.79 | 0.135 | 0.271 | 0.344 | -0.340 | | -0.015 | 0.193 |
| | (0.96) | (1.38) | (2.32) | (3.47) | (3.23) | | (1.32) | 4.32 |

Notes: See Table 8.

Table 11. Values of Beta Coefficients--Equations for the Changes in the Ratio of Debt to GNP

| Equation Number | Def | i | $\frac{BoT}{GNP}$ | $D(\frac{BoT}{GNP})$ | $\hat{TT}$ | $\hat{EUV}$ |
|---|---|---|---|---|---|---|
| Total debt | | | | | | |
| (13) | 0.292 | 0.294 | 0.204 | -- | -0.122 | -- |
| (14) | 0.264 | 0.268 | 0.251 | -- | -- | -0.199 |
| (15) | 0.245 | 0.252 | 0.466 | -0.375 | -0.095 | -- |
| (16) | 0.225 | 0.233 | 0.490 | -0.352 | -- | -0.160 |
| Official sources | | | | | | |
| (17) | 0.247 | 0.326 | 0.101 | -- | -0.121 | -- |
| (18) | 0.232 | 0.305 | 0.115 | -- | -- | -0.146 |
| (19) | 0.235 | 0.310 | 0.178 | -0.105 | -0.114 | -- |
| (20) | 0.222 | 0.292 | 0.182 | -0.095 | -- | -0.137 |
| Private sources | | | | | | |
| (21) | 0.208 | 0.207 | 0.179 | -- | 0.085 | -- |
| (22) | 0.184 | 0.189 | 0.231 | -- | -- | 0.166 |
| (23) | 0.153 | 0.179 | 0.478 | -0.431 | 0.051 | -- |
| (24) | 0.138 | 0.167 | 0.505 | -0.409 | -- | 0.116 |

their external debt are usually determined by the LIBOR rate plus a spread, which reflects the countries' specific risk premia. Of course, official and concessional credits do not carry a free market-determined rate but its variations may well be subject to influences similar to forces as those determining free market rates. Without attempting to provide an exhaustive explanation of the determinants of LIBOR spreads for the countries considered, we estimate a number of equations in this section that assess the role played by different variables in affecting the cost of external debt.

Given that the interest rate on official debt usually reflects concessional objectives, it is expected that some of the factors affecting it are substantially different from those influencing the private, or commercial, rate. For this reason, we estimate here separately an equation for the average interest rates charged by private creditors and by official creditors. The variables that are considered to affect the evolution of interest charges are the following: the fiscal deficit as a proportion of GDP; the changes in terms of trade; the rate of growth of the economy; the stock of debt from private (official) sources as a proportion of GNP or, alternatively, the total stock of debt as a proportion of GNP; and the ratio of private (official) sources of debt to total debt.

The results of the estimations are reported in Table 12. The following pattern of results emerges from these estimations:

a. Regarding the interest rate charged by private creditors, the stock of debt from private sources, both as a proportion of GNP and as a proportion of total debt, has a significant positive effect on the rate. The ratio of total debt to GNP, however, does not significantly affect it. This result seems to indicate that risk premia increase as the proportion of concessional credit falls or, in other words, that private creditors are more concerned with the stock of debt that has to be serviced on commercial terms than with the total volume of indebtedness.

b. An improvement in the terms of trade tends to have a negative impact on commercial interest rates. This may be caused by a reduction in the perceived risk, given the improvement in the ability of the countries to service their debts. On the other hand, the rate of growth of the economy does not, nor does the fiscal deficit, exert any influence on interest charges from private sources.

c. Regarding the interest charges on official credit, a somewhat different pattern of results emerges. In the first place, the effect of the fiscal deficit is highly significant while that of the terms of trade is not. It is therefore possible that official creditors do attach a much higher risk premium to fiscal imbalances than to external price developments. Thus, as far as official credit is concerned,

Table 12. Determinants of Average Interest Rates on New Commitments: 15 Developing Countries, 1972-84

Private Creditors

(25) $i_p = 3.74^{**} - 0.024\ Def + 0.039^{**}(D_p/GNP) + 0.022^{**}(D_p/D) - 0.0076^{**}\ \hat{T}T$
(7.30) (0.82) (2.89) (2.32) (2.02)

$+ 0.004\ \hat{Y} + 0.637^{**}\ LIBOR$ $R^2 = 0.782$
(0.20) (18.55) SEE = 1.336

(26) $i_p = 3.53^{**} - 0.025\ Def + 0.012(D/GNP) + 0.033^{**}(D_p/D) - 0.0069^{**}\ \hat{T}T$
(6.74) (0.83) (1.31) (3.63) (1.81)

$+ 0.007\ \hat{Y} + 0.636^{**}\ LIBOR$ $R^2 = 0.773$
(0.35) (18.14) SEE = 1.361

Official Creditors

(27) $i_o = 9.23^{**} + 0.066^{**}Def + 0.011(D_o/GNP) - 0.027^{**}(D_o/D) - 0.003\ \hat{T}T$
(9.01) (2.05) (0.59) (2.66) (0.79)

$- 0.075^{**}\ \hat{Y} + 0.112^{**}\ LIBOR$ $R^2 = 0.511$
(3.51) (3.03) SEE = 1.423

(28) $i_o = 8.69^{**} + 0.578^{*}\ Def + 0.025^{**}(D/GNP) - 0.022^{**}(D_o/D) - 0.004\ \hat{T}T$
(8.60) (1.84) (2.63) (2.33) (1.02)

$- 0.052^{**}\ \hat{Y} + 0.106^{**}\ LIBOR$ $R^2 = 0.529$
(2.39) (2.96) SEE = 1.397

Notes: See Table 8.

Additional notation is as follows:

$i_p$ = average interest rate on new commitments from private creditors.
$i_o$ = average interest rate on new commitments from official creditors.
$D$ = total debt outstanding.
$D_p$ = debt outstanding from private sources.
$D_o$ = debt outstanding from official sources.
$\hat{Y}$ = rate of growth of real income.

LIBOR: London Interbank Overnight Rate. Dollar denominations, six months.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

the fiscal deficit may have an additional impact on the economy. By increasing the interest charges on new commitments, the fiscal deficit tends to increase further the burden of external debt on the economy. 1/

d. While the stock of official credit relative to GNP does not have a significant effect, the total stock of debt does have a positive effect on interest rates on official credit. The proportion of concessional debt to total debt is also a significant variable: the higher the proportion, the lower the interest charges. Clearly, official institutions appear to attach some degree of risk to the magnitude of commercial debt held by the countries involved. This result, however, carries the undesirable implication that countries with a larger exposure to commercial credit may also end up paying higher charges on their official loans. 2/

e. An interesting result of equations (27) and (28) in Table 12 is the highly significant negative coefficient of the rate of income growth. Although there may be a problem of bi-directional causality, the results point out that a better growth performance is negatively correlated with the interest charges on official credit.

f. Although the coefficients of LIBOR are always highly significant, they are also significantly different from unity in all the equations. This indicates that, everything being equal, an increase in LIBOR tends to reduce the spread. As expected, however, the coefficients for private credit are more than six times higher than for official credit.

## VI. Concluding Remarks

This paper has attempted to survey the public debt situation of a group of developing countries referred to as the 15 Baker countries. It has shown that in recent years there has been, first, a sharp increase in foreign borrowing, accompanied by an equally sharp accumulation of foreign debt, followed by a sharp deceleration in net foreign borrowing as foreign credit became very expensive and much less readily available. 3/ The switch has forced the developing countries

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1/ This would also be due to the fact that a high fiscal deficit is likely to lead to debt-servicing problems and rescheduling; given that moratorium interest is usually higher than interest on spontaneous lending, this would raise the sensitivity of the interest rate to fiscal deficits.

2/ It should be noted, however, that countries that have better access to private markets also have less justification for concessional funds.

3/ The statistical part of the paper covers the period up to 1984. In 1985 and 1986 foreign credit by commercial banks has remained very scarce.

to run very large trade surpluses. This situation has necessitated drastic changes in economic policy. Some of these changes have inevitably had a significant impact on the performance of these economies. In recent years there has been an ongoing debate over whether the imbalances of the developing countries should be financed or whether these countries would have to adjust. While it is clear that lending to these countries could not have continued at the very high rates of growth that had prevailed in the past, the reduction in lending has been much too drastic. We are now well beyond that debate: the countries have been adjusting, and on a large scale. In fact, some would say on too large a scale. It is hoped that more financing will be once again available especially to those countries willing to pursue policies consistent with growth. Several countries are now willing to pursue those policies.

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